Chapter 4 - Transportation

An efficient, safe, and connected transportation system is a key component to a vibrant city. Convenient access to jobs, schools, entertainment, recreation, and critical services such as banking, medical care, and shopping is vitally important to a city's quality of life. Achieving this mobility requires a diverse transportation system of roads, transit, bikeways, and sidewalks.

Existing Roadway System

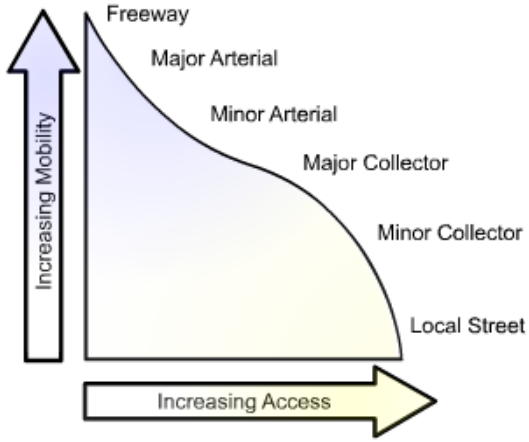
The major highways connecting Pierre to the rest of South Dakota, and the nation, are U.S Routes 14 and 83 and State Highways 34 and 1804. U.S Routes 14 and 83 and State Highway 34 all converge in downtown Pierre and cross the Missouri River Bridge between Pierre and Fort Pierre. U.S. Route 14 is an east-west highway connecting to Brookings to the east and Rapid City to the west. U.S. Route 83 is a north-south highway which traverses through the center of the state and provides connections to North Dakota and Nebraska.

South Dakota Highway 34 is an east-west highway running along the north side of the Missouri River near the Pierre area. It runs from the Wyoming border near Belle Fourche to the Minnesota border east of Egan. South Dakota Highway 1804 is a north-south highway found in the northwest portion of the City and parallels the Missouri river to the north and south. The city does not have direct interstate access; the closest interstate road is I-90 which is approximately 34 miles south of the city and accessed via U.S. Route 83.

Functionally Classified Roadways. Roads serve two primary purposes: mobility and access. Mobility is the efficient movement of people and goods. Access allows those people and goods to reach specific properties. A roadway designed to maximize mobility typically does so in part by limiting access to adjacent properties, for example an Interstate Highway. While a motorist could expect to travel quite efficiently over a long distance using an Interstate Highway, the number of access points is restricted to freeway interchanges every few miles. At the other extreme, a local residential street would provide easy and plentiful access to all adjacent properties, but long distance travel on such a roadway would be impractical (Florida DOT n.d.).

Functional classification is a hierarchical ranking based on the degree of mobility and access that a street provides (Figure 4.1). Streets are generally classified as arterials, collectors and local streets based on the character of the service they provide. This classification is used in transportation planning, roadway design, and for the allocation of federal roadway improvement funds. Figure 4.2 displays the distribution of roadways by functional classification for the City of Pierre as identified by the South Dakota Department of Transportation (DOT).

Figure 4.1. Inverse relationship between road access and mobility (FHWA 2006).



There are approximately 96 miles of total roads within the incorporated limits of Pierre, 90 miles which are hard-surface roads. These include roads which are owned by the City and those which are owned and partially maintained by the County or the State. Approximately four miles of the City's road network are currently gravel roads.

Traffic Volumes. Figure 4.3 illustrates the traffic volumes of the major roadways in the Pierre area as identified by the SD DOT.

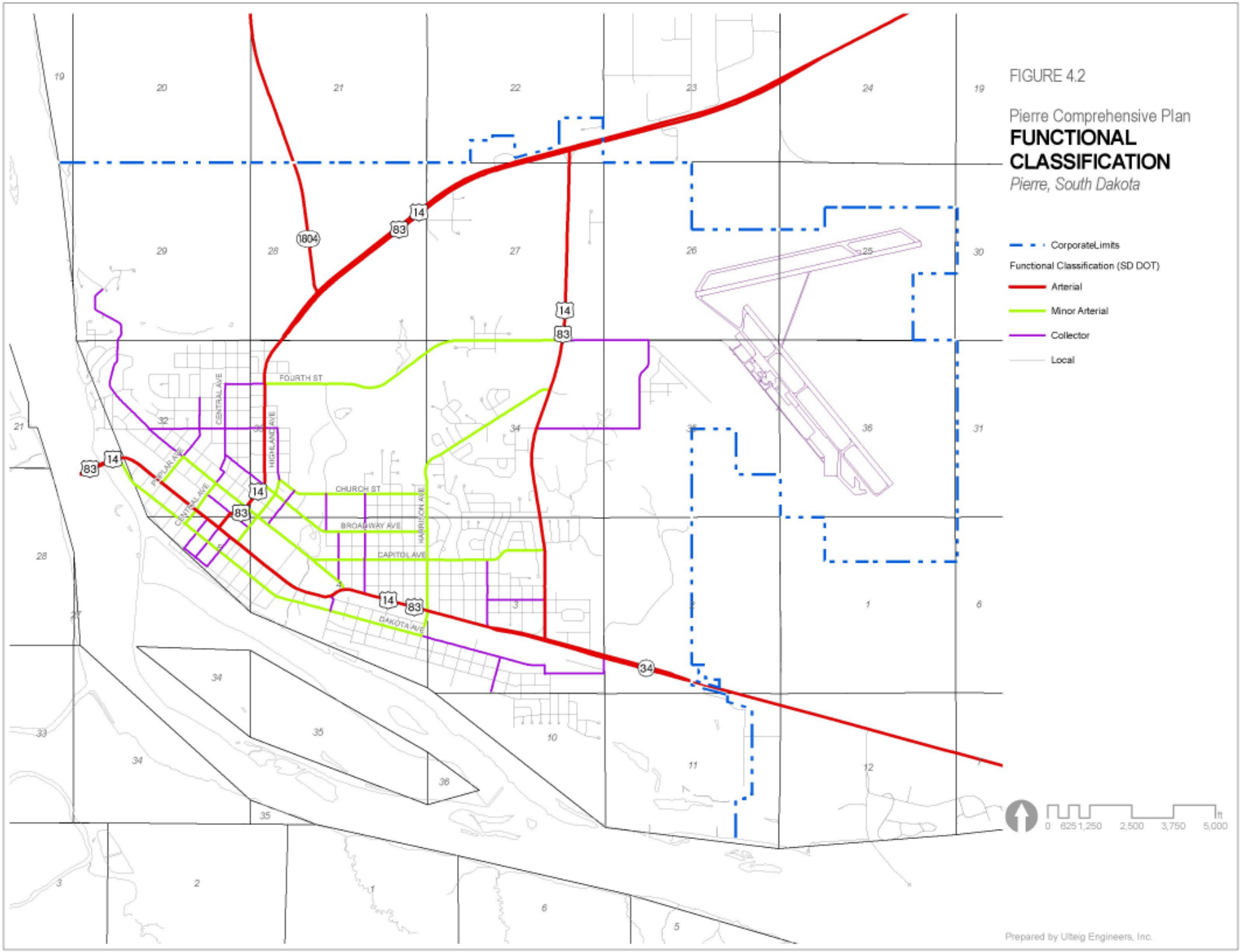


FIGURE 4.2
Pierre Comprehensive Plan
FUNCTIONAL CLASSIFICATION
Pierre, South Dakota
CorporateLimits
Functional Classification (SD DOT)
Arterial
Minor Arterial
Collector
Local
FOURTH ST
CENTRAL AVE
HIGHLAND AVE
POPLAR AVE
CENTER AVE
CHURCH ST
BROADWAY AVE
HARRISON AVE
CAPITOL AVE
DAKOTA AVE
1804
14
83
34
0 625 1,250 2,500 3,750 5,000 ft
Prepared by Ulteig Engineers, Inc.

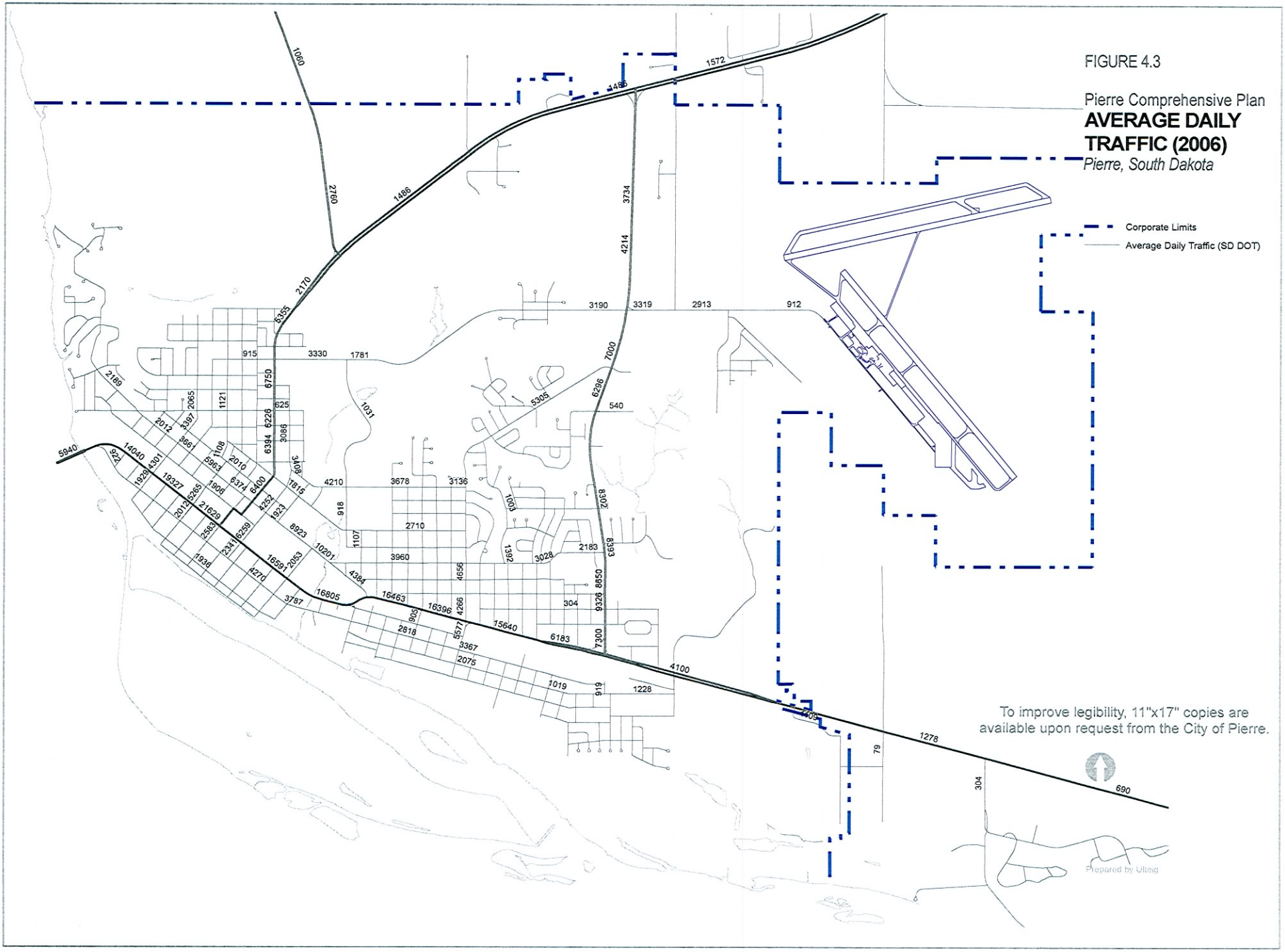


FIGURE 4.3
Pierre Comprehensive Plan
AVERAGE DAILY TRAFFIC (2006)
Pierre, South Dakota
Corporate Limits
Average Daily Traffic (SD DOT)
To improve legibility, 11"x17" copies are available upon request from the City of Pierre.
Prepared by Ulteig

Commuting Patterns. The number of Pierre residents who drive alone to work is nearly 80%, which is slightly higher than the national average. Figure 4.4 illustrates the number of residents car pooling, walking, or working from home. These rates are very similar to the national trends. The average commute time is 10.1 minutes, which is less than half the national average. The greatest share of commute times require 5-9 minutes. Overall commute times have remained consistent between the 1990 and 2000 census (Figure 4.5)

Figure 4.4. City of Pierre commuting to work transportation mode, 2000 (US Census).

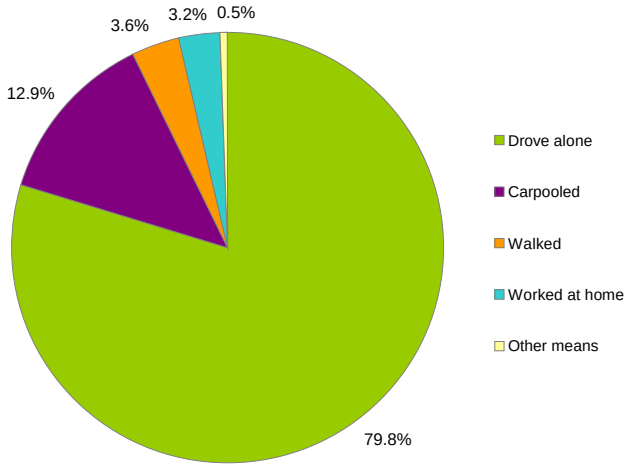
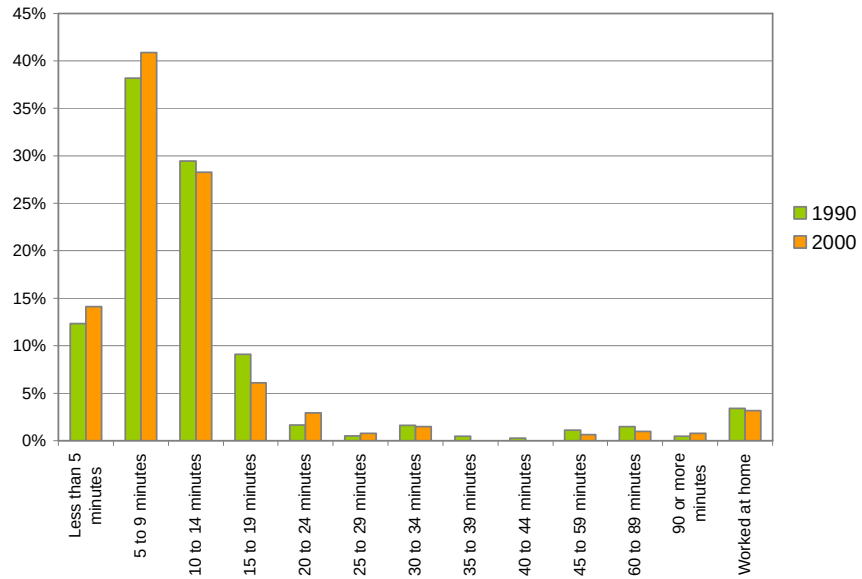


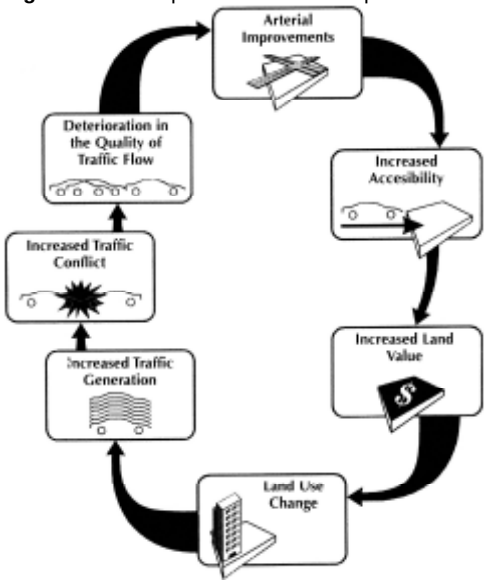
Figure 4.5. Commute times for 1990 and 2000 (US Census).



Roadway System Analysis

Transportation and land use are inextricably linked in numerous ways and have strong influences, both positive and negative, on one another (Figure 4.6). For example, building a new roadway will improve access to an area. This improved access will spur new development and changes in the land use. The change in land use will typically increase traffic and demand for a larger transportation system. This will ultimately create pressures for additional road network capacity expansion.

Figure 4.6. Transportation and development relationship (Stover and Koepke 2002).



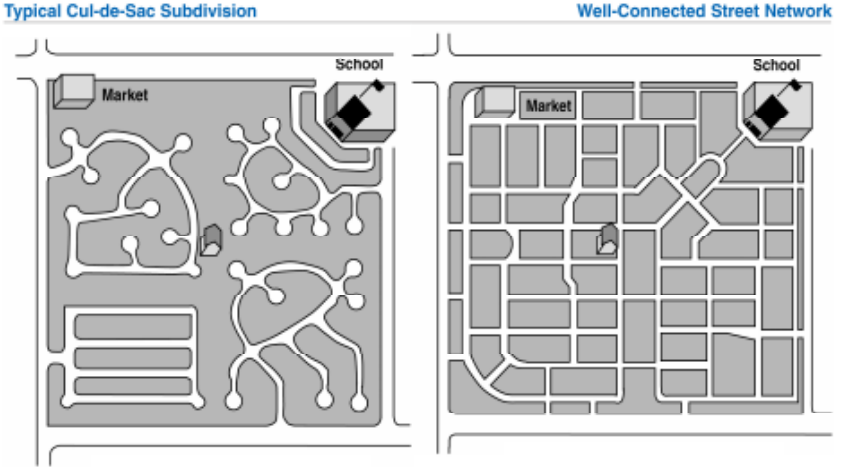
Decisions about land use and the transportation network can positively and negatively influence the following:

- Noise pollution
- Safety
- Value of the land
- Number of vehicle trips
- Traffic flow
- Traffic generation
- Demand for roads
- Change in land use
- Air pollution
- Neighborhood livability
- Drive times
- Dependence on the automobile
- Quality of life
- Public Health (Stover and Koepke 2002, Frank 2000).

Without carefully coordinating transportation infrastructure decisions and local land use planning, unintended and undesirable financial, mobility, safety and quality of life impacts may result.

Connectivity. Developing a sound transportation system relies heavily on street connectivity. Street connectivity – the number of connecting streets in a given area – helps reduce the volume of traffic and traffic delays on major streets (arterials and major collectors), and ultimately improves livability in communities (Figure 4.7). Higher densities of street connections or local street intersections in communities enhance the opportunities for bicycle and pedestrian travel since these modes of travel are local in nature and are more likely to occur when their trip distances can be shortened.

Figure 4.7. Well connected street network versus typical cul-de-sac development (Community Planning Workshop 2000).



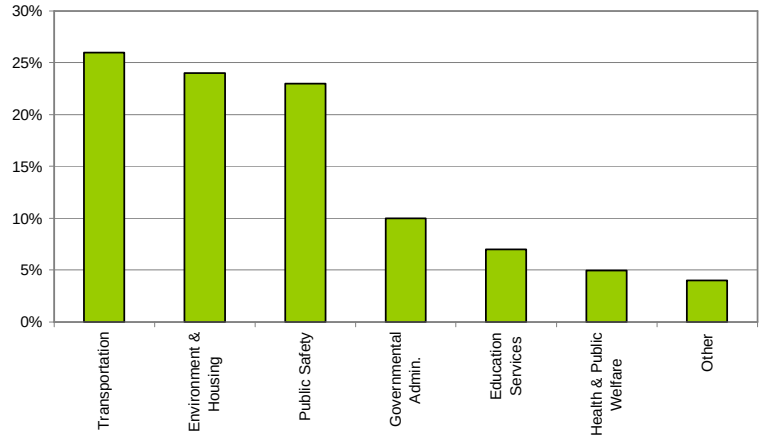
Transportation and land use planning which emphasize street connectivity are beneficial for the following reasons:

- Trip distances can be reduced.
- Traffic on arterial streets can be reduced by providing more transportation routes.
- Automobile dependency can be reduced because biking and walking opportunities are enhanced with multiple direct routes for traveling short distances.
- Local traffic stays local through an accommodating network of small roads.
- Reduced trip lengths ultimately reduce the road maintenance costs for a community.

- Lower speeds on local streets result in reduced accident severity.
- Short blocks with interconnected street patterns better accommodate the development of town or neighborhood centers.
- Emergency vehicles have better access and shorter drive times.

Transportation Expenditures. Transportation is important because it plays a vital role in an area's long term land development and quality of life. It is also one of the largest expenditures for a municipality. Roads account for the single largest expense for cities with populations fewer than 50,000 residents (Figure 4.8).

Figure 4.8. Expenditures for cities with populations under 50,000 (Census of Governments 1999).



Demand for this very large expenditure is directly related to the distribution and density of the population (Stopher and Meyberg 1975). Zoning, subdivision ordinances, and long-range plans play an integral role in determining where new growth will occur, the type and intensity of land use permitted, and the number of new businesses or residents allowed. Decisions that form a city's future land use patterns will ultimately determine the demand for new or expanded roads.

The funding to pay for small cities' largest expense (transportation) will likely become a larger burden on local revenue streams. Research conducted by the National League of Cities found revenue conditions are declining, state aid and support is decreasing, and the lone bright spot in the municipal finance picture is the continued resiliency of the property taxes (National League of Cities 2007). At the national level, the Highway Trust Fund is the key source of funding for the nation's highway system and analysis of recently available Treasury data shows this account could be in deficit starting in 2010 (National Chamber Foundation 2006).

The implication of these financial trends is the likelihood that local transportation expenditures will be funded largely through local revenue streams. This trend emphasizes the need for cities to develop long range plans and development policies that compliment the existing transportation system and limit the need for expensive and likely locally-funded road improvements.

Other Roadway Studies. The results of two studies completed in recent years should be noted in this plan because their findings are being incorporated into this plan's analysis and recommendations. The first study is the 2002 Garfield Avenue/US 83 Bypass Access Management Study. The Study identified all existing access points along US 83 between U.S Route 14 and State Highway 34. The study evaluated needs for access management and made recommendations pertaining to the future disposition of each access point along the corridor.

The second study was the Section 21 & 22 Annexation Study. That study included an analysis of future collector and arterial needs within the study area.

Roadway Spacing. While local roadways are typically closely spaced according to the size of the lots they serve, spacing of collector and arterial roadways often occurs by default if careful planning has not been completed in advance. Improper spacing of collector and arterial roads can put excessive congestion on them if they are too far apart, or can complicate land development if they are spaced too closely together.

The following observations and issues were identified during the review of existing and future conditions pertaining to the functionally classified collector and arterial roads in the Pierre area:

- The City is served by a strong network of principal arterial roadways that are adequately spaced and provide good opportunities for long distance travel.
- The primary arterials carry approximately 50% of the total average daily traffic.
- Part of this increase can be attributed to recent development of adjoining properties.
- U.S. Route 83 Bypass/Garfield Avenue is a designated truck, agricultural equipment, and general highway bypass route. There are no reasonable alternative bypass locations to the east due to the airport and terrain constraints. Therefore it is essential to protect the ability of this roadway to function as a bypass route.
- The City is served by a network of relatively short minor arterial roadways that are adequately spaced, with the possible exception of the area along 4th Street where no north-south minor arterials exist.
- The existing minor arterials provide good opportunities for medium distance travel.

Access Spacing. There are direct correlations between access spacing, roadway capacity and roadway safety. Simply stated, the closer the access spacing, the greater the reduction in roadway capacity and safety.

The following observations and issues were identified during the review of existing and future conditions pertaining to the functionally classified collector and arterial roads in the Pierre area:

- The principal and minor arterials are encumbered by an excessive number of access points, particularly within the older sections of town.
- No minor arterials have been designated east of U.S. Route 14 Bypass or north of 4th Street (SD DOT).
- U.S. Route 14 is a divided four lane highway with a center median between 293rd Avenue (approximately 1 mile east of U.S. Route 83 Bypass) and State Highway 1804. Current access spacing along this roadway includes some offset access points that could impact traffic safety and mobility with higher traffic volumes.
- As development occurs along U.S. Route 14 there will be pressures for additional access. This stretch of roadway is signed at 55 mph. In order to maintain traffic speed and safety on this road segment, it will be necessary to limit the number of access locations.
- U.S. Route 83 Bypass/Garfield Avenue is a designated truck, agricultural equipment, and general highway bypass route. The northern-most mile of this roadway has largely undeveloped land along both sides. This land will be subject to development pressure in the years ahead. This development pressure could reduce the capacity of the corridor to serve as a bypass route. In order to protect this function, it will be necessary to limit the number of access locations.

On-Street Parking. Provision of on-street parking on collector and arterial roadways reduces roadway capacity and safety. Safety impacts are also evident in locations where there is pedestrian activity, as parked vehicles can obscure pedestrian crossings. These impacts become greater as the width of the on-street parking lane is reduced.

Future Traffic Growth. Decisions that locate future growth will result in an increase in traffic on the roadways that serve those areas. Transportation system needs should account for a minimum of 20 years of traffic growth, given that most roadways are designed to last for 20 years without significant maintenance. In the case of structural improvements, traffic projections with longer time periods should be used.

The following observations and issues were identified during the review of existing and future conditions pertaining to the functionally classified collector and arterial roads in the Pierre area:

- Due to right of way constraints within the City, the ability to add capacity or address safety issues wherever they may exist is somewhat limited. Solutions may be very expensive and would likely result in high levels of impact.
- Some sections of the functionally classified collectors and arterials include on-street parking and have access spacing much closer than is desirable. These conditions detract from each roadway's ability to function with optimal mobility.

Barriers. Barriers, such as a river, railroad, or severe terrain can have a dramatic effect on the transportation system. The results of barriers include longer travel trips, misdirection, driver confusion, added traffic congestion, poorly spaced facilities, and high improvement costs.

The following observations and issues were identified during the review of existing and future conditions pertaining to the functionally classified collector and arterial roads in the Pierre area:

- The Dakota, Minnesota & Eastern railroad parallels the Missouri River and U.S. Route 14. The railroad and its limited crossings generate a man-made barrier between the riverfront area and the remainder of the city.
- The steep slopes and rough terrain of the shale bluffs surrounding the City present barriers in both the construction of new roads and connectivity of existing developments.
- The Missouri River is the most obvious natural barrier separating Pierre from Fort Pierre, and other points south and west of the city. Access is limited to the Missouri River Bridge in the southwest corner of Pierre and the Oahe Dam crossing northwest of the City.

Pavement Conditions. A strong pavement maintenance program is essential to protecting the investment of the City's roadway infrastructure. The cost of reconstruction has been proven to far outweigh the cost of timely roadway maintenance.

The following observations and issues were identified during the review of existing and future conditions pertaining to the functionally classified collector and arterial roads in the Pierre area:

- Most of Pierre's major and minor arterials have been resurfaced within the last five years, and are in excellent condition.
- Several of the City's collectors are in fair condition and need to be resurfaced within the next few years in order to prevent the need for more costly rehabilitation.
- The City has a pavement management system that prioritizes resurfacing and rehabilitation. Approximately 20-30 blocks (70,000 sq. yards) of street within the City are rehabbed under the overlay program each year. To maintain streets in their current condition the overlay program should rehab at least 60 blocks of street each year.
- The goal of the current rehab program is to maintain the City streets in their current condition and to delay deteriorating of existing conditions. Additional funding will need to be directed to overlay, reconstruction, and maintenance activities to improve conditions of the City streets.

Traffic Generated Noise. There is a large potential for negative impacts for lands adjacent to highways from highway noise as traffic volume and highway noise rise. This impact is most significant with noise sensitive land uses such as residences, schools, and places or worship. Permitting noise sensitive development adjacent to highways can result in the following:

- Diminished quality of life
- Stagnant or declining property values
- Potential need for costly noise barriers

The SD DOT's document, *Tools for preventing adverse effects from highway noise* (2006), has developed noise abatement criteria. The document recommends local governments use the loudest hour L_{eq} of 61dBA for areas which will include the following activities:

- Picnic areas
- Recreation areas
- Playgrounds
- Active sports areas
- Parks
- Residences
- Motels and hotels
- Schools
- Places of worship
- Libraries
- Hospitals.

The document also recommends local governments use the loudest hour L_{eq} of 71dBA for those areas where people do not normally sleep (SD DOT 2006).

Noise contours measurements are calculated from center line of the highway and go out to the 61dBA (Figures 4.9-4.10) and 71dBA (Figure 4.11) noise contours.

Figure 4.9. Highway noise impact area for noise sensitive land uses with indoor and outdoor or only outdoor activities (SD DOT 2006)

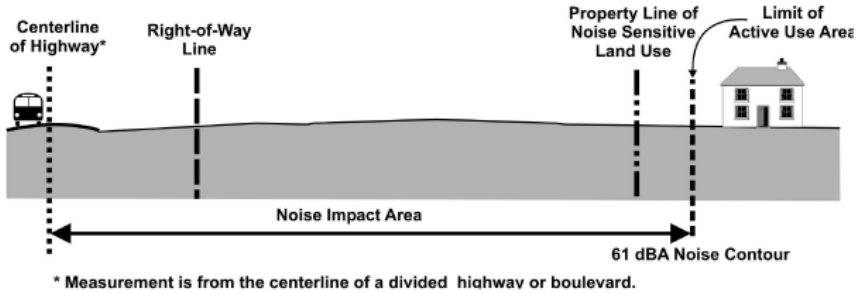


Figure 4.10. Highway noise impact area for noise sensitive land uses with only indoor frequent use, including sleep (SD DOT 2006)

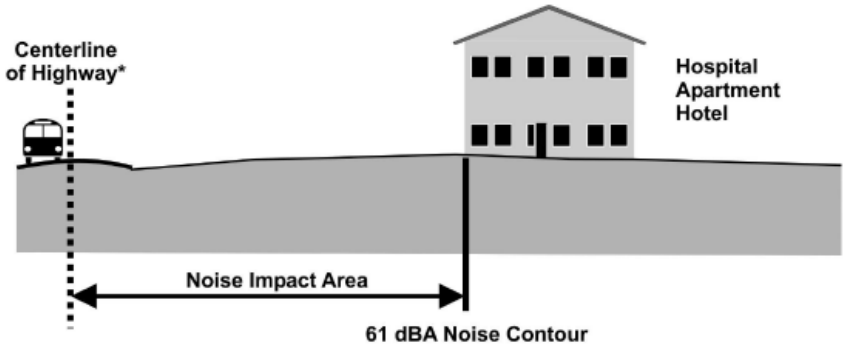
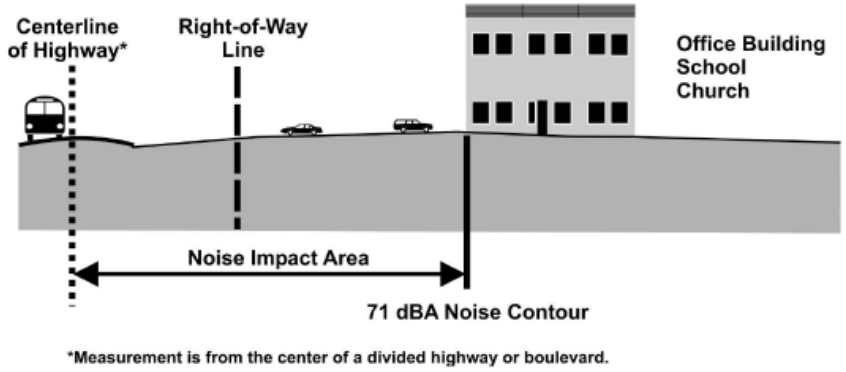


Figure 4.11. Highway noise impact area for noise sensitive land uses with only indoor frequent use, excluding sleep (SD DOT 2006)

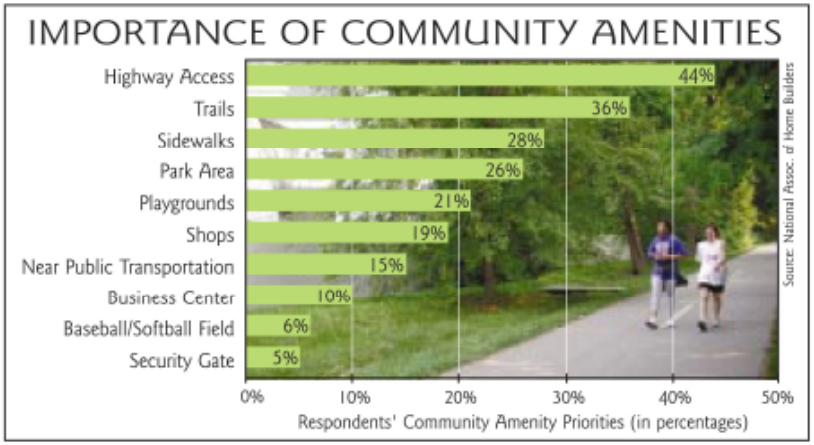


Other Transportation Systems

It is important to understand a healthy transportation network can not rely solely on the automobile. Multiple modes of transportation provide redundancy and reduce demand on any single mode. In some circumstances, increased use of alternative transportation – walking, biking, public transit – can also improve the environmental quality of an area by reducing air pollution and conserving open space. Further, the presence of multiple transportation mode infrastructures, such as sidewalks, multi-use trails and public transit, can offer much-needed alternatives for children, the elderly, the disabled, and low income populations.

The presence of sidewalks and multi-use trails can even have a significant impact on where people choose to buy a house. The 2002 Consumer's Survey conducted by the National Association of Realtors and National Association of Home Builders (Figure 4.12), found that 36% of home buyers designated walking, jogging, or biking trails as either an "important" or "very important" community amenity. Trail availability outranked 16 other options and only highway access was found more important to home buyers (NAR and NAHB 2002).

Figure 4.12. Important of community amenities (Rails to Trails Magazine 2002).



Railroad and Freight. The DM&E railroad splits the downtown area of Pierre. It does not provide significant freight service at the present. Therefore its main impact on the City is that it acts as a barrier. Due to the current energy demands of eastern states, a plan to expand the utilization of the DM&E railroad for coal transportation from Wyoming to points east has been developed. If this plan receives the necessary funding, it will be implemented.

The results include a major increase in the number of trains passing through Pierre. This can significantly limit mobility since most railroad crossings in Pierre are at grade. Railroad analyses completed in 2004 and 2007 evaluated the impacts and recommended strategies to mitigate these impacts. The findings of these studies have been incorporated into the analysis and recommendations pertaining to the transportation system in the Pierre area.

Air traffic. Originally constructed in 1942 as the Pierre Army Airfield by the U.S. Army, the Pierre Regional Airport (PIR) was used as a training facility for B-17, P-40 and P-47 pilots during World War II. The Army deactivated the airfield in 1945 and it was purchased a year later by the City of Pierre (Pierre Regional Airport 2007).

Today, the Pierre Regional Airport is still owned and operated by the City of Pierre. The full-time airport manager, a city employee, manages all day-to-day airport operations. The airport's primary features include two runways nearly 6,900 feet long, a taxiway system, a passenger terminal and support area, and a general aviation (GA) area. There is a precision instrument approach for Runway 13-31 and a non-precision instrument approach for Runway 7-25 (Pierre Regional Airport 2007).

The Pierre Regional Airport is certified by the Federal Aviation Administration (FAA) as an air carrier airport. This certification allows the Airport to be served by scheduled or unscheduled passenger flights with aircraft having a seating capacity of 30 or more. To obtain this certification, the Airport must meet (and continue to meet) the requirements of Federal Aviation Regulations (FAR) Part 139, which prescribes rules governing the operation of airports offering passenger operations.

The South Dakota DOT also has an airport classification system. According to these criteria, PIR is functionally classified as a Transport/Commercial Service airport. Airports designated as Transport/Commercial Service are able to accommodate commercial air carrier aircraft and business jets with approach speeds in excess of 121 knots and by having paved runways over 5,000 feet in length.

The Pierre Regional Airport serves the aviation-related needs of the state capital, its residents and the businesses of central South Dakota - playing a vital role in the state's economy and transportation system. Six airports are located within approximately 60 miles of PIR. These airports have considerably shorter runways than the Pierre Regional Airport and do not have scheduled passenger service. The closest airport with passenger service is Aberdeen, located 161 miles to the east. The next closest airport with passenger service is in Rapid City, 176 road miles to the west.

In 2006, the Airport had the fourth highest number of passenger flights per year in the state (behind Sioux Falls, Rapid City, and Aberdeen) and was fourth in annual takeoffs and landings (operations). Pierre Regional Airport is served by Mesaba Airlines (affiliated with Northwest Airlines and Continental Airlines) and Great Lakes Aviation (code share partners with United and Frontier). Mesaba operates 34-seat Saab 340 turboprop aircraft and Great Lakes operates 19-seat Beech 1900 turboprop aircraft. As the only airport in central South Dakota that provides

scheduled air carrier service, PIR plays an important role as a convenient airport for the residents and businesses of this area.

In addition to the air carrier service, other services available include: "on demand" charters, fuel sales, major and minor airframe repair, engine repair, turbine starting, deicing and aircraft washing, flight instruction and ground school training. Terminal services and amenities are available. Three agricultural spraying businesses, one of which also provides aircraft sales also operate out of the airport.

The Pierre Regional Airport has a Master Plan and Airport Layout Plan (ALP), completed in 2004, which addresses the future development of the airport. The City of Pierre also submits a Capital Improvement Plan annually to the State and FAA that projects their financial needs for five years. Both documents are on file at the office of the City Engineer.
Covering about 1,800 acres, the airport is located within Pierre city limits, three miles east of the city center and four miles east of the Missouri River. Steep ravines dominate the largely undeveloped land to the east and south while land to the west towards Pierre has fewer ravines and is generally used for agriculture, housing and industry. To the north, the land is more level and agricultural use is the most prevalent, with some industrial and residential uses (Pierre Regional Airport 2007).

Transit. River Cities Transit operates a demand response transit system in Pierre and the surrounding area that provides curb to curb services available to anyone including services to elderly and disabled populations. It provides some additional services such as a work shuttle to Lower Brule, Highmore, Harrold, and Blunt that operates 5 days a week.

Waterways. Although the City of Pierre is located on the Missouri River, the river does not serve transportation needs beyond local recreational boating activity.

Multi-Use Paths. Pierre has a well established system of paths serving key locations within the City. The path system does not extend into the heart of the residential areas of the City. A map of the existing multi-use paths is available in Chapter 7 - Parks and Recreation.

Transportation System Plans and Recommendations

Decision makers often wrestle with tradeoffs associated with transportation because in many cases the choices that are beneficial to transportation can be costly and may have negative impacts on people and/or property. Additionally, enforcing optimum transportation design may seem unnecessary unless the sum total of potential compromises is taken into consideration. Therefore, it is important to recognize that compromises in safety and mobility, while individually not significant, can take a heavy toll on the overall functionality of a community's transportation system.

Success in creating a safe and efficient transportation environment is a matter of education and will-power. It is valuable for engineering and planning staff to stay informed in matters of transportation design and traffic operations. Likewise, it is important for staff to take the time needed to educate planning commissioners and elected officials so they understand the impacts of their decisions on transportation and so they can adequately weigh the tradeoffs between transportation and other improvement and land development choices.

Existing System Recommendations. Within the City of Pierre, there is tremendous opportunity to preserve and enhance the existing transportation system. Existing system recommendations focus on roadway needs, as transit, pedestrian-bicycle, railroad and freight recommendations are addressed within the Future System Recommendations section.

Roadway Recommendations. This Comprehensive Plan outlines the purpose and ideal parameters that influence the ability of collector and arterial roadways to move people safely and efficiently. It was beyond the scope of this Comprehensive Plan to evaluate each collector and arterial roadway in detail. Therefore, recommendations are provided more on a system level.

It is recommended that future studies be undertaken to evaluate Pierre's collector and arterial roadways when safety or mobility issues are identified. These planning studies can identify alternatives, as well as their impacts and costs, to resolve these issues. Locations in 2007 which may pose safety concerns include:

- In the vicinity of 4th Street and Euclid Avenue at a daycare drop-off location.
- At the Pierre Street railroad overpass where there is low clearance.
- In the vicinity of the Walmart access onto Garfield Avenue where there are turning movement conflicts.

It is likely that Pierre's best opportunity to upgrade the safety and mobility of its existing street system will come as reconstruction or rehabilitation projects are scheduled for these roadways. That is the best time to undertake efforts such as:

- Consolidating or removing access points
- Changing full access into partial access
- Addressing geometric layout issues
- Removing on-street parking
- Adding turn lanes
- Improving traffic control

Future System Recommendations. Within the City of Pierre, there is also a tremendous opportunity to provide a high level of safety and mobility within future growth areas. It is relatively easy to protect future corridors in potential development areas by appropriate application of subdivision controls.

This Comprehensive Plan recommends general locations of future arterial and collector roadways and key changes to the access into future development areas. These locations and access changes are illustrated in Figures 4.13 and 4.14. Access plans along all highways leading to the City should be completed to determine opportunities to consolidate access and to determine appropriate locations for local roadways to serve the adjoining land on both sides of the highways. Hughes County should be encouraged to complete access management plans along these roadways where land development is likely to occur.

The City of Pierre should adopt minimum right-of-way standards and access spacing guidelines for all roadways and incorporate these standards into its subdivision regulations. The SDDOT access spacing standards for major roadways as found in Chapter 17 of their design manual are shown in Table 4.1. However, similar standards should also be provided for lesser roadways. Table 4.2 provides a good recently adopted example of such standards.

Traffic Noise Recommendations. The following should be addressed by the City to maintain or achieve compatible noise environment for all land uses:

- Prepare a noise contour map for land along state highways
- Prepare and maintain a local highway noise program that make the City eligible for SD DOT technical assistance
- Adopt and implement regulations which seek to prevent future unwanted highway noise impacts
- Seriously consider and consistently apply noise standards in the evaluation of all land use applications and related issues near state highways.

Pedestrian-Bicycle Recommendations. This Plan provides recommendations for the extension of multi-use trails pertaining to recommended greenway/open space areas in the Parks/Open Space Chapter. However, the following key recommendations are highlighted in this chapter as well:

- Construct multi-use paths that parallel the proposed sewer mains along the linear greenway corridors in Sections 21, 22, & 27
- Work with the SD DOT to plan and construct pedestrian/bicycle crossings at future traffic light locations along U.S. Route 14/83.
- Look for opportunities to take advantage of the USDOT safe route to school funding to enhance pedestrian and bicycle routes between schools and surrounding neighborhoods.

Railroad Recommendations. Reconstruct the grade separated crossing at Pierre Street and construct a grade separated crossing at Polk Avenue when funding assistance is made available. This recommendation is based upon a feasibility investigation conducted by HDR Engineering and a citizen group who identified preferred alternatives for railroad grade separation sites. Continue to look for opportunities to reroute the railroad around the City of Pierre.

Airport Recommendations. Establish an Airport Safety Zone Overlay District with appropriate provisions for zoning and subdivision regulations to restrict the intensity of development in certain areas surrounding the Pierre Airport. The function of these provisions is discussed further in the Land Use Chapter.

Transportation Goal

The City of Pierre will have a safe and efficient multi-modal transportation system that meets the mobility needs of the traveling public, is cost effective, and minimizes negative impacts on adjacent land uses.

Objectives:

1. Establish and maintain access management standards which meet or exceed the SD DOT guidelines for urban arterial and collector roadways.
2. Discourage driveway entrances onto highways and other major roads where locations may result in traffic hazards or impede traffic flow.
3. Maintain the effectiveness of truck routes.
4. Secure sufficient rights-of-way to accommodate and extend the City's major street system, including a perimeter system of arterial streets.
5. Establish and protect major transportation corridors and systems, such as the airport, from encroachment by incompatible land uses.
6. Provide multi-use paths as part of greenway or open space corridors wherever feasible and consistent with ongoing parks and recreation planning efforts.
7. Establish collector and arterial roadways in subdivisions in a manner which is consistent with the roadway layouts proposed in the comprehensive plan.
8. Prevent heavy traffic on minor residential streets by requiring a system of collector streets between adjacent subdivisions.
9. Encourage street layouts which minimize overall street length while reducing site grading, drainage and storm sewer requirements to the greatest extent possible.
10. Require road grades and drainage of proposed subdivisions be designed with consideration for continuity with surrounding and future developments.
11. Avoid cul-de-sacs in new developments to minimize street maintenance challenges and costs.
12. Provide traffic control measures consistent with standard traffic engineering practice.
13. Establish and implement local highway noise standards to provide a compatible noise environment for all land uses, and to protect community quality of life.
14. Promote, improve and protect the aesthetic value of highway entrances and the airport entrance/exit to the City of Pierre.

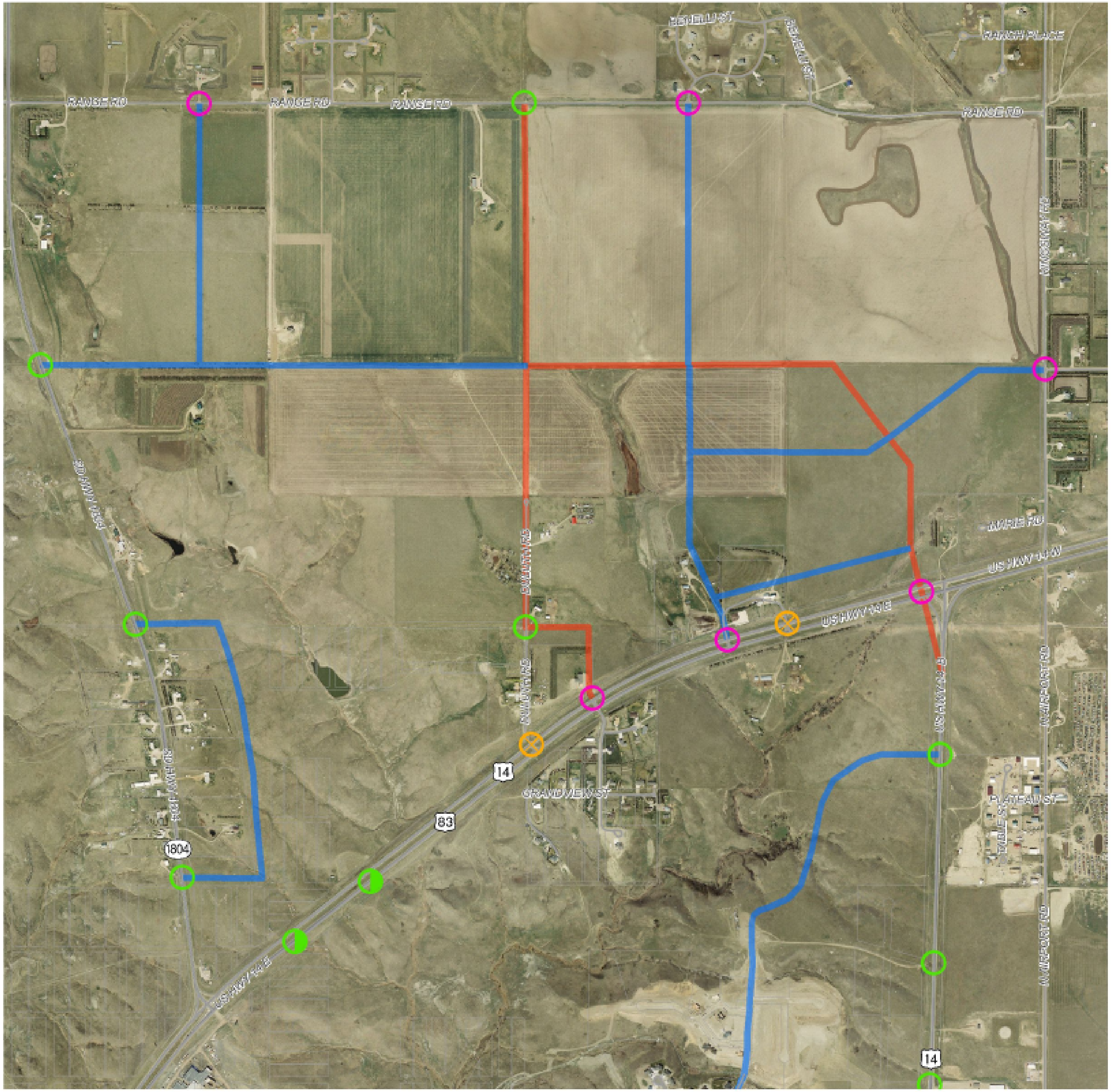


FIGURE 4.13

Pierre Comprehensive Plan

FUTURE TRANSPORTATION

Pierre, South Dakota

- Recommended Access
- Recent DOT Approved Access
- Recommended Access Reconstruction
- Recommended Access Closure
- Existing Roads
- Recommended Arterial
- Recommended Collector

0 312.5 625 1,250 1,875 2,500 ft

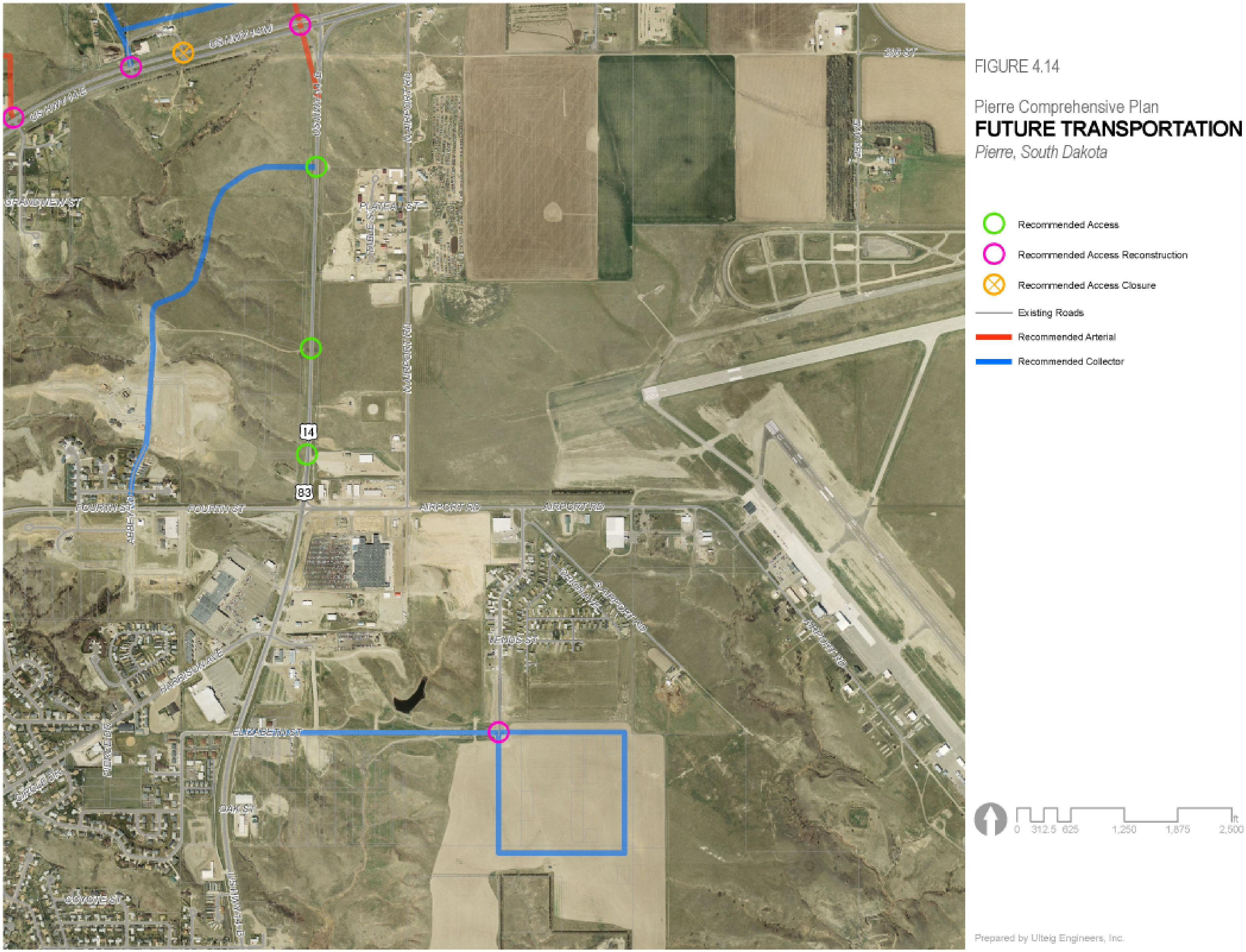
Prepared by Ulteig Engineers, Inc.

FIGURE 4.14

Pierre Comprehensive Plan

FUTURE TRANSPORTATION

Pierre, South Dakota



Prepared by Ulteig Engineers, Inc.

Table 4.1. South Dakota Access Location Criteria (South Dakota Department of Transportation n.d.).

Access Classification	Signal Spacing Distance (mile)	Median Opening Spacing (mile)	Minimum Unsignalized Access Spacing (feet)	Access Density	Denial of Direct Access When Other Available
Interstate	N/A	N/A	N/A	N/A	Yes
Expressway	1/2	1/2 F, 1/2 D	2640	at half-mile increments	Yes
Free Flow Urban	1/2	1/2 F, 1/4 D	1320	at quarter-mile increments	Yes
Intermediate Urban	1/2	1/2 F, 1/4 D	660	1 access/block face, right in/right out preferred	Yes
Urban Developed	1/4	1/4	100	2 accesses/block face	Yes
Urban Fringe	1/4	1/4	1000	5 access/side/mile	Yes
Rural	N/A	N/A	1000	6 access/side/mile	Yes

Notes:

1. *Access to the Interstate system is governed by SDDOT interchange policy. No access shall be provided on non-interstate routes within the following distance of interstate ramp terminals: 1/8 mile directional access, 1/4 mile full access*
2. *N/A = Not Applicable, F = Full Movement – all turns and through movements provided, D = Directional Only – certain turning and through movements not provided.*
3. *SDDOT may defer to stricter local standards.*
4. *SDDOT will seek opportunities to reduce access density wherever possible.*
5. *Rural class minimum unsignalized access spacing may be reduced to 660' by the Area Engineer, based on results of an engineering study as described in 70:09:01:02*
6. *Unsignalized access spacing also is subject to corner clearance analysis.*

Table 4.2. Example of access control guidelines for all roadways (City of Bismarck 2005).

Type of Intersection	Location of Access Point	Minimum Distance from Intersection		
		Low Density Residential	Commercial/High Density	ETA/Rural Residential
Local/Local	Local	25 Feet	150 Feet	100 Feet
Local/Collector	Local	25 Feet	150 Feet	100 Feet
Local/Collector	Collector	60 Feet	150 Feet	100 Feet
Collector/Collector	Collector	60 Feet	150 Feet	100 Feet
Local/Minor Arterial	Local	75 Feet	150 Feet	100 Feet
Local/Minor Arterial	Minor Arterial	300 Feet (1)	660 Feet (1)	NA
Collector/Minor Arterial	Collector	100 Feet	300 Feet	NA
Collector/Minor Arterial	Minor Arterial	300 Feet (1)	660 Feet (1)	NA
Minor Arterial/Minor Arterial	Minor Arterial	300 Feet (1)	660 Feet (1)	NA
Minor Arterial/Principal Arterial	Minor Arterial	300 Feet (1)	1320 Feet	NA
Minor Arterial/Principal Arterial	Principal Arterial	660 Feet	1320 Feet (2)	NA
Local/Principal Arterial	Local	100 Feet	150 Feet (2)	100 Feet (2)
Local/Principal Arterial	Principal Arterial	660 Feet	1320 Feet (2)	1320 Feet (2)
Collector/Principal Arterial	Collector	100 Feet	300 Feet (2)	150 Feet (2)
Collector/Principal Arterial	Principal Arterial	660 Feet	1320 Feet (2)	1320 Feet (2)
Principal Arterial/Principal Arterial	Principal Arterial	660 Feet	1320 Feet (2)	1320 Feet (2)